

Before The
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

RATE ADJUSTMENT DUE TO EXTRAORDINARY
OR EXCEPTIONAL CIRCUMSTANCES

Docket No. R2013-11

**RESPONSES OF THE UNITED STATES POSTAL SERVICE
TO QUESTIONS 1-10 OF PRESIDING OFFICER'S
INFORMATION REQUEST NO. 4
(November 5, 2013)**

The United States Postal Service hereby provides its responses to Questions 1-10 of Presiding Officer's Information Request No. 4, dated October 29, 2013. Answers were sought no later than today. Each question is stated verbatim and is followed by the response. The responses to Questions 1-9 are sponsored by Thomas Thress; the response to Question 10 is sponsored by Altaf Taufique.

Respectfully submitted,

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1. Please refer to the Further Statement of witness Thress, Technical Appendix II. Please also refer to Table 2 on page 8.

- (a) On page II-9 of the Technical Appendix II you state: "The Standard Regular mail equation includes two linear trend variables. The first of these is a simple linear time trend over its full sample period." What is the "full sample period" used to develop the time trend?
- (b) In view of the continuing and substantial decline in the volume of First Class Mail for over a period of 6 years, why is the Trends factor (presented on page 8 of Table 2) positive?
- (c) Since population growth is already contained in the model as an independent factor, does the Trends factor reflect the combined effect of several other variables (e.g., household formation, number of new households, etc.) similar to the Macro Economy and Recession-Induced Factor? If not, please explain.
- (d) If part (c) is answered affirmatively, please list the variables that constitute the Trends Factor.

RESPONSE

(a) The Standard Regular Mail demand equation is estimated over a sample period that begins in 1988PQ1 and ends in 2013PQ3.

(b) The First-Class workshared letters, cards, and flats, demand equation includes a logistic time trend which is included to model positive factors which contributed to First-Class workshared mail volume growth through the 1990s and into the 2000s. These factors included migration of mail from single-piece to workshared mail, positive trends in direct-mail advertising, and increasing numbers of financial transactions. This time trend is logistic, which means that it is increasing at a decreasing rate, so that, for example, the number of First-Class workshared letters added from this variable declined from 1.04 billion in FY 2002 to 0.46 billion by FY 2012.

The First-Class workshared letters, cards, and flats, demand equation also includes three linear time trends, starting in 2002Q4, 2004Q1, and 2008Q1, which have a combined net negative coefficient. The effect of these variables is shown in Columns U and W of sheet 'Volume' of the Excel spreadsheet ExigentImpact.xlsx, which was filed as part of USPS-R2010-4R/10 in this case.

(c) The "Trends" factor is just what the name suggests. It contains the effect of variables that take the form of time trends. In most cases, these trends are linear, although, for example,

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the First-Class workshared letters, cards, and flats equation includes a logistic time trend.
Please see also my response to POIR No. 1, Question 4.

(d) N/A

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2. This question concerns the advances in communications using the Internet that occurred during 2004-2010, including the launching and widespread adoption of wireless broadband, smartphones, tablet computers, and social media channels; the increasing market penetration of broadband Internet service; and growing percentage of American adults who used the Internet to purchase goods, pay bills, or engage in other commercial transactions

(a) Please explain how the econometric demand equations estimated in this docket distinguish between (1) the effects of the 2007-2009 recession and (2) technological and social changes cited above. If your response relies on any data or analyses not previously produced in this Docket, please produce them.

(b) Please describe the characteristics of explanatory variables that reflect the effects of the 2007-2009 recession and the characteristics of explanatory variables that reflect the effects of technological innovation and resulting social trends during the 2004-2010 period.

RESPONSE

Please see my response to POIR No. 3, Questions 1 and 2 for a general overview of the Internet, the Great Recession, and the effect of these factors on mail volume.

(a) Generally speaking, “the advances in communications using the Internet that occurred during 2004-2010” are largely continuations of pre-existing trends in non-mail-based communications. For example, smartphones are a new way to access the Internet, but, measured objectively, via “Internet” variables, trends in Internet usage have actually slowed down in recent years. The first Internet variable used by the Postal Service in its econometric demand equations was consumption expenditures on Internet Service providers. To the best of my knowledge, this variable is no longer publicly available. But even before it disappeared, it ceased to be of any use in explaining ongoing diversion as this variable reached its peak in December, 2007. Similarly, but less extremely, broadband penetration (as measured by total broadband households divided by adult population) increased by more than 260 percent from FY 2002 to FY 2007 (Quarter 4 to Quarter 4). Since then, the growth rate for broadband penetration has steadily declined, to 9.6 percent in FY 2008, 5.1 percent in FY 2009, 3.8 percent in FY 2010, 3.6 percent in FY 2011, 2.6 percent in FY 2012, and, most recently, 1.6 percent for FY 2013.

The rate of diversion and other negative trends affecting mail volumes appears to have increased significantly in recent years. But these increases are not the result of newer or better technologies: the pace of technological innovation has been ongoing for decades if not centuries, Internet penetration is nearly complete within American society, and newer technologies (e.g., tablet computers, social media) are more likely to be replacing older

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technologies (e.g., laptop computers, e-mail) than to represent entirely new outlets of possible mail diversion.

My view is that the technological and social changes since 2004, and importantly since the start of the Great Recession in 2007, are continuations of existing trends. Their impacts on mail volumes are properly captured by a continuation of the impact of the trend variables that pre-date the Great Recession. For example, I estimate that 19.0 billion pieces of First-Class Mail were lost from FY 2004 through FY 2010 as a result of a continuation of pre-existing trends, most of which can be thought of as being a result of the continuation of the diversion of First-Class Mail.

New trends that have only emerged with the Great Recession, however, represent changes to the underlying demand for mail that are clearly connected to the economic impacts of the Great Recession. The effect of the Great Recession on mail volume trends is explored in detail in my response to POIR No. 3, question 1.

To the extent that “technological and social changes” were affecting mail volumes prior to 2007, the impact of such factors will be captured econometrically through variables which mirror the timing and shape of such impacts – i.e., time trends which extend earlier than 2007. But, to the extent that “technological and social changes” have coincided in timing with the Great Recession, I do not believe that this is mere coincidence but is, instead, reflective of the far-reaching impact of the Great Recession on the overall demand for mail.

(b) Explanatory variables that would be expected to pick up cyclical effects of the 2007-2009 recession would likely exhibit a cyclical pattern that coincides closely with the timing of the 2007-2009 recession. Examples of such variables would include the macro-economic variables that are used in various Postal demand equations.

Explanatory variables that would be expected to pick up the effects of technological innovation and resulting social trends would likely take the form of long-run time trends. Such variables are included in several Postal demand equations.

Explanatory variables that would be expected to pick up changes in mail volume trends resulting from the factors which caused and have been triggered by the events of what I have called the Great Recession, such as Americans' declining use of credit cards and reduced volumes of other types of financial mail, would likely take the form of shorter-length time trends starting over the past few years.

Explanatory variables that would be expected to pick up permanent drops in mail volume resulting from the factors which caused and have been triggered by the events of what I have

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called the Great Recession, such as the permanent 21 percent drop in total advertising expenditures from 2007 to 2009, would likely take the form of variables that begin to grow at some point in this time frame before plateauing at a constant long-run level. An example of such a variable is the non-linear intervention variable in the Standard Regular demand equation used by the Postal Service in this case.

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3. Please refer to the Excel file RCFDATA of Library Reference USPS-R2010-4R-9.

- (a) Please confirm that the file RCFDATA.xlsx does not contain any of the linear time trends or intervention variables described in the Technical Appendix II.
- (b) If part (a) is confirmed, please provide a library reference with a file that includes the complete quarterly data series corresponding to all linear time trends and all intervention variables used or created by all demand equations that have been filed for Docket No. R2013-11. If such file is already included in the existing library references, please provide the name of this library reference, the corresponding file and tab.
- (c) If part (a) is not confirmed, please indicate the tabs and cells of RCFDATA.xlsx that contain the requested information.
- (d) Please confirm that different linear trends and intervention variables are created dynamically during execution of the regression programs that are included in USPS-R2010-4R-9. If not confirmed, please explain.

RESPONSE

(a) The full-sample time trend, TREND, can be found in column AX of sheet 'EViews' of RCFDATA.xlsx. Confirmed that linear time trends which begin at later dates and intervention variables are not included in RCFDATA.xlsx.

(b) The quarterly values for all of the intervention variables and time trends relevant to my analysis are constructed on sheet 'Intervention' of the Excel spreadsheet, Sources-of-ChangeCalcs.xlsx, which was filed as part of USPS-R2010-4R/10, starting at row 570. Quarterly data series for all historical time periods over which such variables are constructed are presented as part of the econometric output provided as part of USPS-R2010-4R/9.

(c) N/A

(d) Confirmed.

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4. Please refer to Library References USPS-R2010-4R-9 and USPS-R2010-4R-10.

(a) Please provide the stationarity tests you performed while developing the time series dataset for demand equations. As part of your response, please describe the techniques you applied to develop the stationary datasets to be used for estimating the demand equations.

(b) Please refer to the output from the econometric demand equations presented in Library Reference USPS-R2010-4R-9, folder Public Econometrics, file "out_p.txt." Please provide the interpretation of the results of the listed stationarity tests and indicate for what class(es) of mail demand equations include non-stationary time series. If you include any non-stationary time series data in your calculations, please explain in detail how non-stationary variables were treated in the demand equation estimation.

(c) For all variables used in demand equations for First-Class Single-Piece letters and cards (or First-Class Single-Piece letters, cards and flats), please explain which time series are stationary and which are non stationary at 5 and 10 percent significance levels.

(d) In Library Reference USPS-R2010-4R-9, folder Public Econometrics, file out_p.txt, you provide an R-squared value for the regression demand equation estimated for First-Class Single-Piece letters, cards and flats which is almost 0.998. Please explain whether such a high R-squared value could be due to non-stationary variables in the model.

RESPONSE

(a) Augmented Dickey-Fuller tests for stationarity are performed on the dependent variables and regression residuals for all of the Postal Service's econometric demand equations. Results of these tests are presented within the econometric output provided in USPS-R2010-4R/9. No additional stationary tests were performed on any other data.

Generally, the way that one corrects for non-stationarity within one's data is to first-difference the data. It is generally not desirable, however, to first-difference data which are already stationary. Given a mix of stationary and non-stationary data, then (as is the case with many of the Postal Service's demand equations), doing adjustments of this type will lead one to either "correct" data which does not need correction or will lead to a break in the theoretical relationship being modeled if some data (e.g., the dependent variable) are differenced while other data (e.g., some of the explanatory variables) are not differenced.

Several experiments have been undertaken recently to look at the issue of stationarity vis-à-vis the Postal Service's econometric demand equations. Across-the-board first differencing of all of the Postal Service's data produced significantly less accurate and more unstable econometric results. As noted above, this was undoubtedly because the first-differencing of all data led to an over-correction of data which, in many cases, were already stationary. More

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sophisticated Error Correction Models were also investigated. With these models, in many cases, differencing the non-stationary time series produced much worse out-of-sample forecasts due to the potential problem of the loss of low frequency information.

For a formal, academic discussion of how stationary residuals are sufficient for econometric estimation, see, for example, "Inference in Linear Time Series Models with Some Unit Roots", by Christopher A. Sims, James H. Stock, and Mark W. Watson, *Econometrica*, vol. 58, no. 1, pp. 113 -144.

(b) The null hypothesis associated with the Augmented Dicky-Fuller (ADF) tests presented in my econometric output is non-stationarity. If the "Test Statistic" is greater than the "Critical Value", then the null hypothesis of non-stationarity can be rejected at a 95% confidence level.

No adjustments were made to any of the Postal Service's econometric models based solely on any potential non-stationarity of dependent variables. The only concern from an econometric perspective here is potential non-stationarity of the regression residuals, which is generally not a problem with the Postal Service's other econometric equations. In this case, the only two equations presented in out_p.txt for which the ADF test statistic on the residuals does not exceed the critical value are Postal Penalty and Insurance.

(c) The stationarity of individual variables was not tested. See my response to part (a) of this question for a discussion of why.

(d) It is common within empirical econometric work to find very high R-squared values when evaluating time series data which includes a strong trend component as it is fairly easy in such cases to "explain" much of the variation in such variables using either time trend variables or explanatory variables that exhibit similar trends. To the extent that non-stationary variables frequently exhibit such a strong trend component, your statement is likely to be true.

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5. Please refer to Library Reference USPS-R2010-4R-9.

- (a) Please state whether any non-positivity constraint was imposed on any own price elasticity.
- (b) Please explain whether without imposing a non-positivity condition, the estimated own price elasticity becomes positive, and, if so, please provide the value of this positive own price elasticity.
- (c) If part (a) above was answered in the affirmative, please explain fully whether this imposition of a non-positivity condition might econometrically push the estimated elasticity toward or close to zero.
- (d) Please explain in detail whether the reason for a positive own price elasticity without any condition could be due to missing variable(s) (such as e-substitution variables).

RESPONSE

(a) No constraint was imposed on the sign of the own-price elasticity in any of the econometric demand equations used in this case. The coefficients on specific lags of price were (weakly) stochastically constrained using a technique developed by 2013 Nobel Laureate Robert Shiller to ensure that the coefficients on price lags were internally consistent with one another. This constraint, which is implemented stochastically as minimally as possible, imposes no restrictions on the overall sign of the estimated own-price elasticity in these equations, however.

(b) N/A

(c) N/A

(d) The omission of relevant explanatory variables within an econometric equation can adversely affect the estimated coefficients of the variables included in the equation to the extent that the omitted variable(s) may be correlated with the included variables.

None of the demand equations relied upon in this case include positive own-price elasticities, however. In addition, the demand equations relied upon in this case do include specific variables that are intended to account for the impact of possible e-substitution. Because of this, this question is wholly inapplicable to the present case.

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6. Please refer to the "Narrative Explanation of Econometric Demand Equations for Market Dominant Products Filed with Postal Regulatory Commission on January 20, 2012" (filed on July 2, 2012). On pages 14-15, the Postal Service states: To "better measure the increasing depth of Internet use, the Postal Service's methodology for modeling Internet and other electronic diversion has changed somewhat for the demand equations filed with the Postal Regulatory Commission on January 20, 2012. For the demand equations for domestic mail, diversion is no longer modeled via explicit Internet variables, but, instead, is measured through a series of simple linear time trends that start at various times within the sample periods of which the Postal Service's demand equations are estimated."

(a) Please confirm that the demand equations filed in Docket No. R2013-11 continue with the methodology described in the quote above of using trends in place of explicit Internet variables to measure electronic diversion. If not confirmed, please explain fully.

(b) Did the development of the demand equations filed in Docket No. R2013 11 include the exploration of any explicit Internet variables as candidate explanatory variables? If so, please describe the variables considered, the statistical tests performed, and the reasoning that led to the exclusion of these variables from the final demand equations. As part of your response, please produce all data series generated for such explicit Internet variables, if applicable.

(c) Are there any explicit Internet variables for measuring electronic diversion used for developing demand equations before 2012 that were not considered in Docket No. R2013-11? If so, please describe all such variables and provide the relevant data series. If the complete data series are not available, please provide whatever versions of the explicit variables data series that were used for developing demand equations prior to 2012 and identify the original source for the data.

RESPONSE

(a) Confirmed.

(b) No such experiments were conducted between the development of the demand equations filed with the Commission on January 22, 2013, and the development of the equations presented in this case.

(c) As discussed briefly in my response to question 2 of this POIR, the Internet usage variables which have been used in the past to help model the demand for mail volumes do not properly capture recent rates of diversion. The first Internet variable used to help model the demand for mail volume was consumption expenditures on Internet Service Providers. This variable peaked in December, 2007. It would therefore be mathematically impossible for such a variable to help explain increased diversion since that time.

The Internet variable used most recently to help model the demand for mail volume was the number of Broadband subscribers (deflated by adult population). Broadband usage per adult grew by 9.6 percent from 2007PQ4 to 2008PQ4 (an increase of 0.027 units – although the

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"units" of this variable are somewhat indeterminate). Broadband usage per adult grew by 2.6 percent and 0.009 units from 2011PQ4 to 2012PQ4. Mathematically, then, such a variable would imply that the rate of Internet diversion should have declined – probably significantly – over the past four years. It appears, however, that just the reverse has happened. This strongly suggests to me that Internet penetration and technological innovation are insufficient explanations for these more recent negative trends in mail volumes which have, instead, been triggered by outside events, including most significantly, the factors which caused and have been triggered by the events of what I have called the Great Recession, such as Americans' declining use of credit cards and reduced volumes of other types of financial mail and the restructuring of the U.S. advertising market. See my response to POIR No. 3, Questions 1 and 2 for an elaboration of this topic.

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7. Please refer to the July 1 Narrative and the Further Statement of witness Thress.

(a) The First-Class Workshared Letters, Cards, and Flats model filed on January 22, 2013 (see page 34) includes the last linear trend starting at 2008Q3. However, in Mr. Thress's statement (Technical Appendix, at page II-6), the last trend is described as having started in 2008Q1. Please explain this apparent discrepancy and explain what factors contribute to these differences.

(b) For other mail categories (aside from workshared First-Class Letter Mail), please identify the locations in the July 1 Narrative and Mr. Thress's "Further Statement" that have different starting dates for trends. For all different trend starting dates identified, please explain such apparent discrepancies including the factors contributing to these differences.

(c) Please provide the slopes of the "three linear trend lines, which start in 1993Q4, 2002Q4, and 2007Q4" mentioned on page 15 of the July 1 Narrative at 15 that were used to estimate mail volume diversion in your First-Class Single-Piece demand equation(s).

(d) Please provide the three slopes of the three linear trend lines referred to in part (c) without the use of the "filtered macroeconomic data" technique described on pages 7-8 of the July 1 Narrative.

RESPONSE

(a) Efforts to improve and refine the Postal Service's econometric demand equations are ongoing. In the case of First-Class workshared letters, cards, and flats, it was observed that the rate of diversion appeared to lessen somewhat in the mid-2000s. This can be seen, for example, in the Recursive Residuals for 2005 and 2006 in the January 22, 2013, equation, which tend to be fairly consistently positive (suggesting that actual volume is greater than would have been predicted from a model ending one quarter earlier).

This new time trend is statistically significant with a t-statistic of 2.57. With the introduction of this third trend, the appropriate starting dates for the two other time trends were re-evaluated, resulting in the minor date change noted in this question. Overall, these changes resulted in a slight improvement to the mean-squared error for this equation from 0.000114 in the January 22, 2013, filing to 0.000109 for the equation used in this case.

(b) The demand equations for First-Class single-piece letters and cards and First-Class single-piece flats presented to the Commission on January 22, 2013, were replaced with a single demand equation for First-Class single-piece letters, cards, and flats, in the present case. The former equations were estimated over sample periods which started in 2004Q1 and included diversion trends starting in 2004Q2 and 2007Q4 (in both equations). The combined

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equation is estimated over a sample period which starts in 1983Q1 and includes diversion trends starting in 1993Q4, 2002Q4, and 2007Q4.

In addition to First-Class Mail, the following changes were made to the existence and/or starting dates of trends within the econometric demand equations used in this case as compared to those filed with the Commission on January 22, 2013.

- Standard ECR Mail: removed time trend starting in 2009Q1.

This change was accompanied by an additional change to the Standard ECR model that replaced a simple dummy variable for the implementation of R2006-1 (which eliminated automation discounts for Standard ECR letters) with a non-linear intervention variable that more gradually attenuated to a long-run constant. These changes were made based on evidence that the growth rate for Standard ECR mail volume has stabilized recently, suggesting that earlier declines in Standard ECR mail volume may have been the result of R2006-1 more than an increasing negative trend in the wake of the Great Recession. The newer equation has a somewhat lower mean-squared error, 0.000415 versus 0.000426.

- Periodicals Mail: removed time trend starting in 2000Q3, added time trends starting in 2008Q2 and 2011Q2.

These changes were made because they better match up with historical growth rates in Periodicals Mail volume. The newer equation has a lower mean-squared error, 0.000249 versus 0.000275.

- Registered Mail: added time trend starting in 2001Q3

This change was made to help explain increasing negative growth in Registered Mail volume over this time period. The t-statistic on this trend coefficient is significant at -2.28.

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- Certified Mail: replaced time trend starting in 2011Q1 with non-linear intervention variable attenuating to a constant long-run value starting at same time.

This change was made to reflect the fact that Certified Mail volume has stabilized recently.

- Money Orders: removed time trend starting in 1999Q2, added time trend starting in 2009Q2

The former of these was removed because it was insignificant (t-statistic of -0.43 in the January 22, 2013, equation). The latter was added based on evidence that the negative trend in Money Orders volume appears to have accelerated in recent years. This latter trend has an estimated t-statistic of -2.63.

(c) The discussion referenced in the July 1 Narrative was intended to be merely illustrative of the general technique used in my work. The specific example referenced here was inadvertently held over from the Narrative Description from earlier years and does not apply to any equations which were filed with the Postal Regulatory Commission in January, 2013.

The slopes of the three linear time trends included in the demand equation for First-Class single-piece letters, cards, and flats, used in the present case are -0.0099 (t-statistic of -24.54), -0.0011 (t-statistic of -1.24), and -0.0127 (t-statistic of -18.86), respectively.

(d) I am not sure what you are requesting in this subpart of the question. Replacing the trend component of employment with total private employment (per adult) in the First-Class single-piece letters, cards, and flats demand equation used in this case changes the coefficients on the three linear time trends to -0.0122 (t-statistic of -4.414), 0.0045 (t-statistic of 0.799), and -0.0171 (t-statistic of -3.217), respectively. Making this change also increases the mean-squared error of the demand equation from 0.000261 to 0.004159. Please see my prior discussion of these matters in this case in response to POIR No. 1, Question 9, and POIR No. 3, Questions 3 and 4.

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8. Please refer to the July 1 Narrative at pages 9-13. The July 1 Narrative explains that "Intervention Analysis" as this term is used on page 9 includes "trends."

- (a) Are the linear time trends for Internet diversion considered to be an "Intervention Analysis"? If not, please explain.
- (b) If your response to part (a) is in the affirmative, was this linear trend a result derived from using a transfer function for Single-Piece First-Class Letter Mail and other products which allows for all types of outcomes?
- (c) If your response to part (b) is in the affirmative, why are they distinguished in a separate section of the Narrative as trends instead of Intervention in the Narrative? If your response to part (b) is in the negative, please explain the difference between trends and Intervention Analysis.

RESPONSE

(a) The general term "Intervention Analysis" can be used to refer to any change in the level or trend of mail volumes which starts at a particular time. This can include simple dummy variables, time trends, or the more complicated non-linear Intervention analyses which I employ in some cases.

(b) The diversion trend methodology employed in this case was developed over the course of several years of experimentation to attempt to find the best method for modeling this behavior. That work included experiments with fully-defined Intervention transfer functions which allowed for pulse, step, and trend reactions to mail volume within a single function.

Based on these earlier experiments, it was found that attempting to include shifts to both a long-run step level as well as changes to trends starting at the same point in time tends to produce very unstable results. Consequently, the decision has been made that these are best viewed as an either-or proposition: either the long-run trend has changed or volume has/is gradually shifted to a new long-run level.

The choice between these two possible outcomes is continually re-evaluated as new data become available. See, for example, my response to your question 7.b of this POIR, where I point out that long-run trends in earlier versions of the demand equations associated with Standard ECR Mail and Certified Mail have been modified more recently, with these trends being re-modeled as non-linear step functions instead. See also my response to question 5.e of POIR No. 2, which presents and discusses econometric experiments using a full transfer function within the demand equation for First-Class single-piece letters, cards, and flats mail.

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(c) As I said in my response to part a., one can view Trends as a special case of Intervention Analysis. Trends are distinguished from level shifts in my Narrative simply because they represent different mathematical phenomena and are likely to be explained by different factors.

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9. Please refer to Library References USPS-R2010-4R-9 and the "Narrative Explanation of Econometric Demand Equations for Market Dominant Products as of November 2012" filed with the Postal Regulatory Commission on July 1, 2013 (July 1 Narrative).

(a) Please explain why in Docket No. R2013-11 you estimate the combined elasticity of First-Class Single-Piece Letters, Cards and Flats in place of the traditional use of separate elasticities for (1) letters and cards, (2) flats, and (3) parcels estimated in the model described in the July 1 Narrative on pages 26-32.

(b) Please provide a comparative table that shows elasticities for First-Class Single Piece letters and cards, flats and parcels calculated using the method described in the July 1 Narrative and using the combined method implemented in Docket No. R2011-13.

RESPONSE

(a) Prior to the implementation of R2006-1 rates, the only shape-based price distinction among First-Class single-piece mail was between cards and non-cards (i.e., letters, flats, and parcels). RPW volume data generally does not distinguish between mail types within a single rate category, so volume data were not available that distinguished between First-Class single-piece letters, flats, or parcels.

With the introduction of separate prices for First-Class single-piece letters, flats, and parcels with the implementation of R2006-1 (in May, 2007), considerable interest arose within the Postal Service to attempt to identify and understand differences in the demands for First-Class single-piece (and workshared) mail by shape. To satisfy this interest, considerable effort was therefore invested in attempting to develop separate shape-based demand equations for First-Class single-piece mail.

In the January 22, 2013, filing, separate demand equations were estimated for First-Class single-piece letters and cards, First-Class single-piece flats, and First-Class parcels (single-piece and workshared). Volume data consistent with RPW volumes for First-Class single-piece mail by shape do not exist prior to FY 2004. Because of this, the First-Class single-piece mail demand equations presented in the January 22, 2013, filing were estimated using a sample period that started in 2004Q1.

For this case, a single demand equation was estimated for First-Class single-piece letters, cards, and flats. This equation was estimated over a sample period starting in 1983Q1.

The decision to switch to the combined equation was made for several reasons. First, because of the shorter sample periods, the separate shape-based First-Class single-piece mail equations tended to be more sensitive to the addition of single new quarters of data. This made their results somewhat more sensitive to erratic changes over time. Second, the results from the separate shape-based equations were not sufficiently different to necessarily warrant

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estimating separate equations. This was due, in part, to the shorter sample periods that had to be used, which tended to reduce the statistical significance of the econometric results from these equations. For example, in the equations filed on January 22, 2013, the estimated own-price elasticity of First-Class single-piece flats was three times greater than the estimated own-price elasticity of First-Class single-piece letters and cards (-0.27 versus -0.09), but neither of these results were at all significant (t-statistics of -0.68 and -0.28, respectively), so it was not prudent to draw any conclusions about the relative price elasticity of First-Class single-piece letters vis-à-vis flats.

Finally, because of the extremely short sample period, separate shape-based demand equations for First-Class single-piece mail are particularly unreliable for identifying, understanding, and quantifying changes in the demand for mail before, during, and after the Great Recession. With sample periods starting in 2004PQ1, that leaves only three years of data before the earliest effects of the Great Recession. It is very hard (and fairly foolish) to try to draw conclusions about what the "typical" demand for a product might be based on three years of data. In contrast, the combined equation incorporates a long enough sample period that it includes two previous recessions as well as several earlier changes in the apparent rate of electronic diversion. This longer sample period makes the conclusions being drawn in my Further Statement much stronger than they might otherwise have been.

First-Class parcels continue to be estimated using a separate equation using data only available since 2004Q1. This is done for two reasons. First, First-Class parcels have recently been divided into two types of parcels: retail and commercial, with the latter of these re-classified as "Competitive". To avoid mixing public and non-public data, First-Class parcels were therefore excluded from the analysis in my Further Statement for this case. Second, recent trends in First-Class parcels volume – particularly First-Class commercial parcels – differ dramatically from the trends associated with other types of First-Class Mail. This strongly reinforces the idea that First-Class parcels are a distinct mail-stream with distinct demand characteristics which differ from the demand characteristics associated with First-Class single-piece letters, cards, and flats. Prior to 2004, First-Class single-piece mail volume is adjusted downward based on the proportion of First-Class single-piece mail that was parcel-shaped in FY 2004 (1.01 percent) to create an estimated historical time series which includes only First-Class single-piece letters, cards, and flats.

(b) Updating the demand equations filed on January 22, 2013 to best incorporate data through 2013Q3 produces an estimated own-price elasticity for First-Class single-piece letters

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and cards of -0.154 (t-statistic of -0.531) and for First-Class single-piece flats of -0.270 (t-statistic of -0.909).

The own-price elasticity used in this case for First-Class single-piece letters, cards, and flats is -0.157 (t-statistic of -2.268).

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10. Please refer to Library Reference USPS-R2010-4R-2 - First-Class Mail Worksheets. Please confirm that the value in Excel Workbook WP-FCM-R2010-4R, tab "DVD Mail," cell 9D, should be \$0.441. If not confirmed, please explain.

RESPONSE:

Confirmed. Please see POIR4.Qu10.Response.xls (in which the corrected cell referenced in the question has been highlighted).

Besides that correction, some other minor corrections have been made in POIR4.Qu10.Response.xls to match the billing determinant corrections made to the CPI First-Class Mail file.

Primary Changes:

Tab: **Quarterly BDs**

1. Cell E11 reflects the corrected additional ounce estimates for Q4 FY12 SP Flats.
2. Cells C24 & B37 reflect the accurate label for the additional ounce pertaining to Presort Letters (Automation & Nonautomation)
3. Cells J39 to N39 provide the Picture Permit data that was inadvertently omitted from the original CPI filing.
4. Cells J41 & J42 provide the source of Picture Permit Data

Tab: **Presort**: Cell D35, Formula Correction for FS IMb Flats.

All the resulting/secondary changes have also been highlighted in:

Tab: **Hybrid Yr. Billing Determinants** – Cells J11, C24, and C36.

Tab: **Single-Piece** - Cells D25, F25, and H25

Tab: **Presort** - Cells F35 and H35, Added Row 39, and Cells F41, and I41

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Tab: **Presort Ltrs & Crds** - Added Row 35, Cells F36 and I36

Tab: **Flats** – Cells D6, F6 and I6, Cells D22, F22 and I22

Tab: **Percent Change Summary** – Cells C5, D5, & E5, Cells C6, D6, and E6 and Cells C10, D10, and E10. (Please note that some cells were already highlighted in the original filing to indicate deviation from the across the board change.)

Tab: **Single-Piece** – Cell G12

Tab: **Presort** – Cells H9, H19, H20, H31, H32, and H33.

Besides the changes in the domestic tabs, the primary change in the tab: **FCM International** was for the inbound postage. Cells C13, E13 were the primary change. As a result cells C15, E15 and G15 also changed. Another secondary change was in tab: **Percent Change Summary**. Highlighted cells are: C9, D9 and E9.